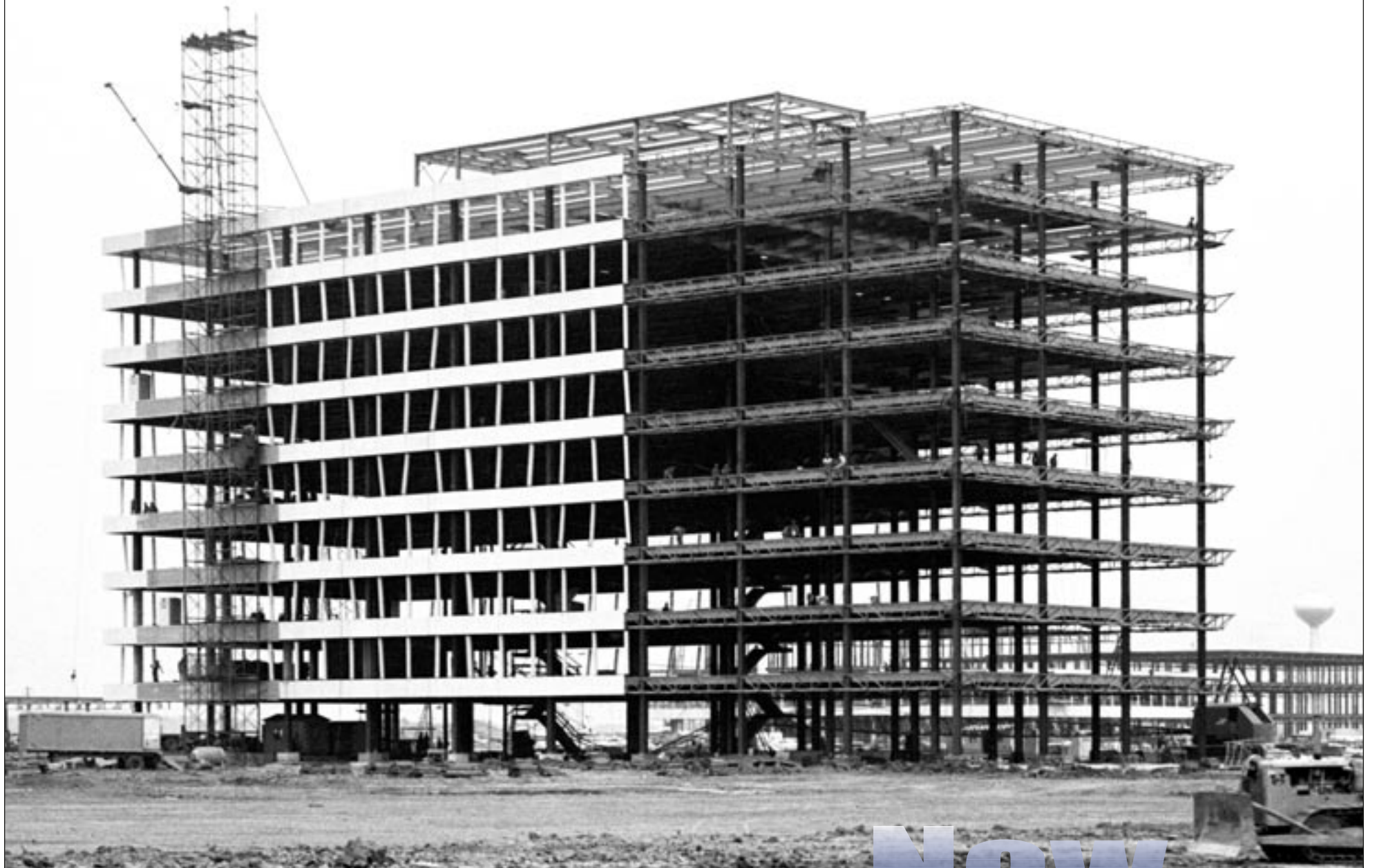


Space Center Roundup

VOL. 40, NO. 20 LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEXAS November 30, 2001

Then...



...Now

NASA JSC 97e00865



Forty years ago, NASA announced its Manned Spacecraft Center would be located in Houston. In this issue of the Roundup we take a look back at the history of the world-famous Johnson Space Center.

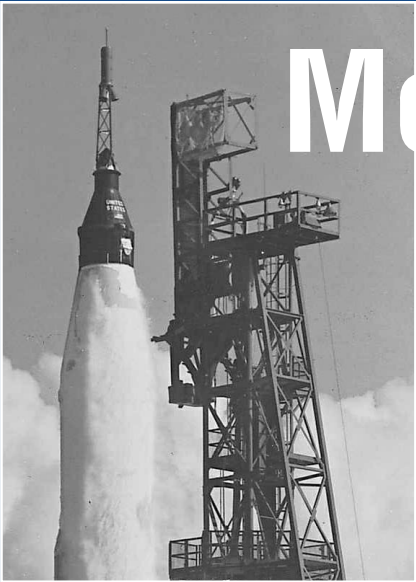
NASA JSC S63-06371

The landscape of Johnson Space Center has changed significantly over the past 40 years. Above shows the center's beginnings with the construction of Bldg. 1 in the early 1960s. The inserted photo shows the sprawl and beauty of JSC today.

A legacy of excellence

It has been home to the U.S. human space flight program from the final Mercury flight to today's space shuttle and International Space Station missions. In October, NASA's Johnson Space Center celebrated 40 years of leading America into space.

The history of JSC is the history of America's human space flight program. Both illustrate the determination and the vision of people to rise to unexpected challenges and to work together to attain success. Every step along the way, the *Roundup* has been there to give recognition to the people and the programs that have made the human space flight program possible. Here's a look back at the history of JSC and the *Roundup*.



NASA JSC 62-00363

Mercury



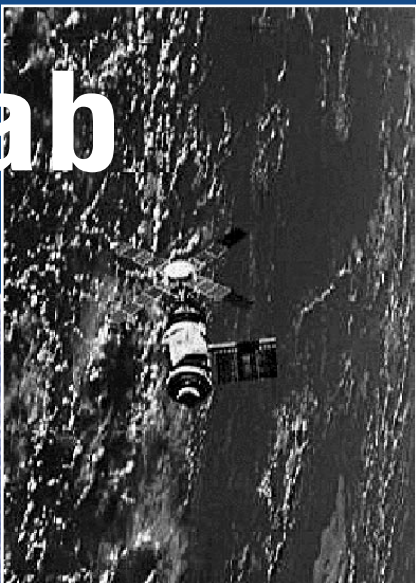
NASA JSC s66-50767

Gemini

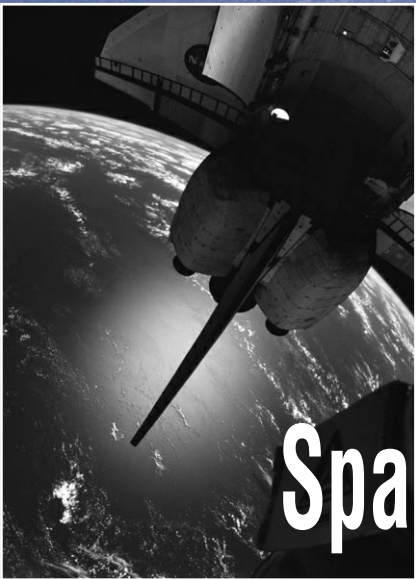


NASA JSC 11-40-5903

Apollo



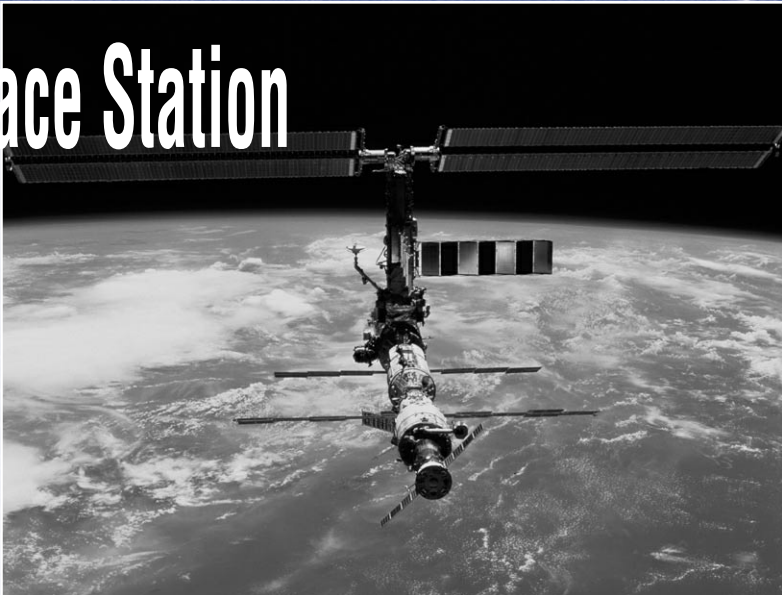
Skylab



NASA JSC sts105-726-056

Space Shuttle

International Space Station



NASA JSC sts102-714-078

Telling the story

Roundup celebrates 40 years of memories

During the past two scores, our knowledge of outer space has expanded in ways never thought possible. Through it all, the *Space News Roundup* has been there.

The first edition of the *Roundup* was published Nov. 1, 1961. The front-page headline on that issue announced the renaming of the Space Task Group (STG) to Manned Spacecraft Center (MSC) and the move of the center from Langley Air Force Base in Virginia to Houston.

The remaining pages look similar to today's version: Stories on personnel, briefs on the happenings of NASA and a look at the hot topics of the time. There was a great deal of excitement in the air with the move to Houston, the announcement of the Project Mercury Astronauts and the talk of landing an American on the moon.

With that first issue, the *Roundup* firmly established itself as the proud voice of the Center – a voice that

is just as strong 40 years later.

In the Teague Auditorium's lobby, there's a tribute to the *Roundup's* significance in the history of U.S. human space flight. One can travel back in time simply by reading the *Roundup* pages presented there, paying tribute to the contributions from the JSC workforce.

The *Roundup* has spotlighted many of the people who have played numerous roles over the past four decades. Those employees have formulated the teams that

made possible Ed White's spacewalk, the moon landing, the transformation from MSC to JSC, Skylab, the Space Shuttle and now the International Space Station.

On Pages 3, 4 and 5, you will meet four editors who have guided the *Roundup* over the years. Putting together the publication takes many hours and much energy. In the end, however, these editors believe it's one of the greatest services one can do at Johnson Space Center. ■

What's in a name?

So how did the *Roundup* get its name? We found the answer on the back page of the first *Roundup* published on Nov. 1, 1961. Here's the scoop:

150 Entries Are Submitted In Contest to Name Paper

A committee of five from the offices of the Special Assistant to the Director, Flight Systems Division, Life Systems Division, Operations Division and the Personnel Office met Oct. 2, 1961, to choose the name of the MSC house organ from the 150 names submitted by personnel of the organization.

The name selected, after a period of elimination was *Space News Roundup*, submitted by Phoncille De Vore, Office of the Director. The committee members were given only the list of names submitted for use in making their choice.

In order that proper recognition might be given to the many persons who submitted suggested names for the paper, all suggested names follow. They are:

Adventurers, Astomarin, Argonaut, Astro-Note, Astronauts' Almanac, Astro-Star, Apollo Picture, A-O-K, Astronaut, Astro News, Astro-Jots!, Apollo Applause, Apollo Apothegems, Apollo Apologies, Apropos, Astro Times, Apollo, All About the Moon People, Air-lock, Asteroid, Asteroid Beep, Apobee, Astropost, Astrapost, Argonaut, Ad Astra, Analune, Astron, Astronews, Astro-vox, Au Gratin, Blastoff, Big Star, Booster, Bi-weekly Rendezvous, Capsule, Celestial Times, Celestial Frontiers, Cat and the Fiddle, Cherry Pickin' News, Capsule Call, Changing Times, Countdown, Cynthian, Das Capsule Flngenabout, Propagandishcer Blatt, Explorer, Ecliptic, Extraterrestrian, Eyes and Ears

of Space, Freedom Line, File 13, Galaxy, Galaxie, Galaxie Gazette, Heat Shield, Informer, Jet Stream, Laker, Lunar Latest, Lunar Probe, Launching Pad, Lunation, Lunar News, Lunar Booster, Luminous Journal, Lone Star, Lunar-Tics, Lunarian, Lunar Newser, Lunar Lore, Meteor, Meteorwrite, Milky Way, MSC Message, MSC Moonbeams, Manned Space Flyer, Moonbeam, Moondust, Moon Observer, Missile, Man Upstairs, M.C.S.N., Moon Probe, Moon Beam, Moon Message, Moon Shiner, Moon Memos, Nebula, NASA News, News of History, Nasams Views, Newtonian, New Frontiers, Nasanaut, Nasanaut Log, Orbit, Outerglobe, Probe, Plasma Scoop, Planetarium, Planetary News, Pioneer, Pocket

Rocket, Planetoid, Rocket Roar, Rocket, Stairway to the Stars, Spaceway Scoop, Space Probe, Space Traveler, Space Pioneer, Space Frontiers, Spaceship, Space Vehicle, Space Sanskrit, Spaceman, Space Probe, Space Raider, Space-Capades, Space Blazer, Spade, Satellite, Spectograph, Spectogram, Spacegram, Space for Space, Space News Vehicle, Spacecraft Chronicle, Spacecraft, Space Riders, Space Sage, Space Chronicle, Space News Roundup, Spacial News, Sidereal Times, Space Gazette, Spacecrafter, Space Probe, Spacecraft News, Space Traveler, Turning Times, Tall Story, Telescope, Upstairs Bulletin, Void, Vacuum, Voyager, Vox-Pop, Way Out, "X" Transponder.

In the beginning

By Anne Bray

I was the one-woman staff of the *Space News Roundup* during Project Mercury. It was the best job I ever had.

Sure there were later jobs that paid better, some that were less work and some that were more fun, but, to a life-long reader of science fiction, nothing else ever came close to a front-row seat at America's first manned space flights while we raced to catch up with the Russians.

I arrived at Langley Air Force Base in Virginia in February 1962, to find one lone secretary holding the Public Affairs Office fort while Director John A. "Shorty" Powers, my boss-to-be and first *Roundup* editor, Ivan Ertel, and the rest of the then entire PAO staff were down at the Cape waiting out the interminable weather delays before John Glenn's first orbital flight.

Having already missed the two sub-orbital flights in May and June of 1961, Shepherd's MR (Mercury-Redstone) 3 and Grissom's MR-4, I spent most of Glenn's MA (Mercury-Atlas) 6 staring across an empty office at the secretary. We had a radio but no TV. It was a letdown.

The reason I couldn't go to the Cape was that my security clearance hadn't even been started yet. In fact, I had been verbally hired by Ivan and Shorty and then made to take the civil service exam. PAO did things sort of pell-mell in those days. The whole atmosphere

of the space program was hellbent-for-leather.

Immediately after Glenn's flight, I was up to my ears in choosing and sizing eight-plus pages of photos of Glenn's New York ticker tape parade and address to Congress for the 12-page whopper edition we put out March 7. It just got wilder after that, eight full-sized pages or more every two weeks.

After a while we added a two-page "slip-sheet" to the centerfold to contain the Secretary of the Month, cafeteria menus and other strictly local stories. This was because Col. Powers lacked a budget for brochures and mailable literature on the American space program but had a liberal house-organ budget. He used the *Roundup* as a mailout to, for example, every member of Congress. We just left the slip-sheet out of the mail-out copies.

I've been asked for the top five stories from my era, and my off-the-top answer was MA-6, Scott Carpenter's MA-7, Wally Schirra's MA-8 and Gordon Cooper's MA-9.

However, second thoughts bring to mind the ongoing story of our incremental, division-by-division, move to Houston. PAO moved in April of 1962, losing my security clearance paperwork in the process, which nearly killed my Cape trip for the MA-7 launch May 24.

Most of us had never been to Texas, and were somewhat uneasy about moving halfway across the country from the East Coast. We need not have been – Houston literally welcomed us with open arms.

All I had to do to get a charge account at a leading department store was walk through it wearing my Mercury lapel pin, a miniature Mercury spacecraft that was a freebie from McDonnell Douglas. The manager grabbed my arm and insisted I should fill out a little more than my name and address before I was handed the card. I bought a stereo for my new apartment before I left the store.

Our temporary office buildings were scattered around southeast Houston, roughly centered on Gulfgate Mall. If you had an interview with anybody in another division, you had to get in your car and drive there.

Some of the facilities were very nice, like the Farnsworth Chambers Building, and some not so great, like the converted warehouse on Telephone Road where the *Roundup* lived for a while.

On weekends, our most popular recreation was driving down to the site east of Webster and looking at the huge, muddy holes in the ground where they were installing plumbing and electrical conduit for what would one day be the "Manned Spacecraft Center."

It seemed to take forever, and we could hardly wait. Unfortunately, the actual move-in took place in the spring and summer of 1964, by which time Project Mercury was over and I had moved on.

Another major story was the selection of nine more astronauts to add to the seven Mercury guys, whose names and faces were

nationally recognized by this time. Then there were the continuing stories dealing with the plans for Apollo, such as Grumman's selection to build the lunar module. We ran stories about the upcoming Gemini Program, too, but everybody was really focused on the moon as a place to go.

I was upgraded from (the only) Staff Writer to Editor in September of 1962. My greatest contribution was to throw open our pages to a series of guest articles from the major NASA contractors who were building space hardware and Mission Control, running a two-page spread with pictures across the centerfold for each one. The contractors loved it and it cut my job down significantly.

The final Mercury mission splashdown occurred in the Pacific rather than the Atlantic, and instead of spending the flight at the Cape, a group of PAO people (me among them) was dispatched to Honolulu to man the Pacific News Center. This, the longest Mercury mission, was still only one day. It was so successful that MA-10 was deemed unnecessary.

In July of '63, I ran a sad little article on the end of the Mercury program, and, unwilling to wait for the start-up of manned Gemini flights, left the civil service.

The following September Paul Haney took over as PAO director, replacing Shorty Powers.

It was the end of an era.

A word from our editors.....



NASA JSC 2001e39632 Photo by Robert Markowitz

Over the past 15 years, the *Roundup* has been served by just three editors: Bill Jeffs, who served from August 1998 until March of this year; current editor Melissa Davis and Kelly Humphries, who produced half of all the total *Roundups* during his 12 years as editor. In this photo, the three hold issues that reflect their era.



NASA JSC 2001e39634 Photo by Robert Markowitz

By Melissa Davis

In honor of the *Roundup's* 40th anniversary issue, I wanted you to meet some of the people who have worked on the publication over the years.

On the previous page, Anne Bray's column provides insight into the early days of the *Roundup*. Her often-humorous words brought to life an era that is legendary in American history.

On the following page, both Kelly Humphries, who served as *Roundup* editor for 12 years, and my predecessor Bill Jeffs share their memories while recognizing those who have worked to help make the *Roundup* a success.

These three provide a snapshot of all the hard work, effort and time that has gone into keeping the *Roundup* a staple in the life of JSC.

I am proud to be the *Roundup's* current editor. Even more than being proud of my position, I am proud to be a part of the JSC family. In fact, it is the greatest honor I have ever known.

Even though I've been at JSC since March, it still doesn't seem real at times. As a lifelong resident of Indiana, I never dreamed this Hoosier would ever be among the incredibly talented people that make up the JSC team.

So many people who work at JSC tell me how they always wanted to work for NASA. For them, landing a position at

JSC was the fulfillment of a lifelong quest. For me, I never dreamed about working at JSC because I never imagined there would be a place here for a journalist.

Astronauts? Yes. Engineers? Yes. Journalists? Nope.

Lucky for me, there is.

Journalism is my passion. I've loved it since my first photojournalism class as a high school freshman. I enjoy how nothing is the same each day in this fast-paced, deadline-driven environment. While it is frequently stressful, it is also invigorating.

However, what I appreciate most about being a journalist is this fact: I can be whoever I want to be, depending on the story I am working on.

In my reporting career, I've gotten to be, sometimes on more than one occasion, a police officer, a firefighter, a 100-year-old man, a doctor, a company president, a teacher, an executive, a singer, a coroner, a pilot and a mayor.

I've experienced the good times in a person's life, and I've experienced the not-so-good times too. In 1999 I spent more than seven months writing a series of columns about a single mother of two dying of cancer. Angie's story alone had the greatest impact on my life than all of my other experiences combined.

Stepping into other people's shoes has allowed me to look at life from a much different perspective than most. Yet, telling someone's story in my own words is an awesome – and sometimes overwhelming – responsibility. In order for me to give each story its proper respect, I must become that person, if only for short time.

So imagine my sense of amazement and gratitude to have the position I have now. In my job I am given the great privilege to share with you one of the greatest unfolding stories ever known – the story of our country's human space flight program. I still get chills thinking about all the people I am allowed to become.

Since taking over the *Roundup* from Bill, I have learned an incredible amount about our space program in a short time. I have learned of our many successes but, more importantly, I have learned of our many struggles. Knowing how hard each

person here works through the difficulties makes our successes that much sweeter.

I firmly believe nobody knows struggles like those who have worked with the *Roundup*. I am so impressed by the work of my predecessors because I know intimately of the difficulties they've faced. Yet, I am confident those who have put their time in on the *Roundup* also have a great deal of satisfaction in their product. I know I do.

There is so much that goes on behind the scenes that readers have no idea about. My current assistant editor, Co-op Aaron Wyatt, and I spend our days balancing the many e-mails, phone calls and submissions we receive as we work to build each issue of the *Roundup*. I am so glad Aaron didn't pack up and head back home to Nebraska after his first month of *Roundup* chaos – it can be a bit overwhelming. This job is like boot camp. I know Aaron will be much stronger from his time spent on the *Roundup*.

While my name and Aaron's name are the two you see in the staff box, there are many people who make each issue happen that never get named. In this column, I wanted to recognize some of them because their work is just as valuable and important to the *Roundup* as mine.

I want to recognize:

- ❖ My supervisor B.J. Tomaro, who works her hardest to move mountains for me. Once they're removed, Beej stands back and let's me do my thing.
- ❖ PAO Director Dan Carpenter, who always challenges my thinking and yet trusts my judgment. That's a priceless combination in this line of work and I am grateful for his support.
- ❖ Mark Sowa and his excellent photography staff, who constantly work to give me the shots I need and want. They are an incredibly talented bunch.
- ❖ Maura White, Stephanie Tomek-Foster and the other friendly folks in digital imaging, who accommodate my whims and are always nice about it in the process.

- ❖ Cheerie Patneau, who is my friendly White Sands correspondent. Cheerie is always there to keep us informed about our friends in New Mexico.
- ❖ Ignacia Ramirez and the mailroom staff, who have the thankless job of maintaining the *Roundup's* distribution list. She is always friendly and ready to help.
- ❖ Beth Nischik, who is my faithful PAO liaison. Beth caught my vision for the *Roundup* in the beginning and has worked to help make my ideas a reality.
- ❖ Nicole Cloutier and Bill Jeffs, who helped make the transition from their leadership to mine.
- ❖ Julie Burt and Eric Raub, who were much more than college student helpers, but lifesavers in the beginning of the *Roundup's* "Melissa Davis era." Julie and Eric both are fine people who made this overwhelming job not just bearable but fun. I miss them greatly.
- ❖ Finally, Betty Conaway, who is the creativity behind the *Roundup's* design. She is often my sanity too. I have experience in graphic design, but it makes all the difference in the world when I have a talented person like Betty that can bring my ideas to life. Betty makes my many trips to Bldg. 227 fun – even as we work under pressure each and every time. While my Co-op staff changes, Betty is my one constant. For that I am grateful.

Believe it or not, there are many more people who play a part in the *Roundup's* creation. This truly is a center-wide effort, and I am honored to work with so many different people from so many directorates.

With such a high-caliber team in place, I am even more excited about the *Roundup's* future. Beginning next year, the next phase of the *Roundup's* long history will be launched. I will wait until that issue to introduce our new product.

Until then, I hope you enjoy this issue's trip back in time. Be proud of your contributions to JSC because I am proud to tell your story. ■

Roundup Memories

By Kelly Humphries

I remember coming to work at JSC in September 1986. It was a tough time for the agency, following the *Challenger* accident in January. The late Brian Welch was the editor of the *Roundup* at the time and had been the editor for about seven years. One of my initial assignments was as assistant editor of the bi-weekly *Roundup*.

One of my earliest stories was about the first underwater robotic arm to be used in what was then the Weightless Environment Training Facility in Bldg. 29. Up until then, there had been no way to simulate the use of the shuttle's robotic arm in space walk training activities.

Guy King was the engineer in charge of the project, and it turned out to be a very interesting feature. The real, electronic shuttle remote manipulator system can't even carry its own weight in Earth gravity, so King had developed a sturdier, hydraulic arm for use in the caustic environment of the pool. The story was a great tale of hands-on engineering work at JSC, something that was a priority at the time. And Guy remains a friend today.

Another early story that I remember working on was about orbital debris, or space junk. What started out as a single story turned out to be a two-part Feb. 6 and 20, 1987, in-depth piece about what continues to be a serious issue today. One of the prime interview subjects for the story was Joe Loftus, now assistant to JSC's Engineering Director, who even 15 years ago was an icon of engineering and orbital mechanics expertise.

He and Don Kessler, who raised the idea of space junk as a serious threat to our overall space program to the international level, explained the seriousness of the issue with an analogy that I'll never forget: Space debris orbiting the Earth travels about 6 to 7 kilometers a second; at those speeds a grain of sand has the destructive power of a bowling ball going 100 miles an hour. If that doesn't get your attention, you've probably already had a close encounter with a bowling ball.

We're still working with the world's space powers to build launch vehicles and satellite delivery systems that minimize space junk, and on protecting things like the International Space Station from such hypervelocity impacts today.

My first issue as editor was Sept. 25, 1987. The main article that issue was about the announcement that Disney Imagineering would design a new multi-million dollar visitor center for JSC, which eventually would come to be known as Space Center Houston. Then-JSC Director Aaron Cohen and Public Affairs Director Hal Stall were joined by local and national government officials for the press briefing. I'm sure they're all proud of what Space Center Houston has become today. It was also the issue in which the STS-27 crew was announced. Veteran Commander Hoot Gibson was to be joined by then-rookie flier Bill Shepherd.

Back in those days, PAO was using an early local area network of computers to

do all of its word processing, but that was before computer modems and data transfers were as commonplace as they are

today. I remember hand-carrying "copy" to an off-site contractor facility, where it was retyped by hand and laid out using layout sheets, offset type printers, Exacto knives and waxers by Sid Jones, who continued to be my "main man" on *Roundup* production throughout my tenure with the *Roundup*.

Jones, who still works in the JSC graphics shop that now is on-site, was and is a true professional who could work wonders

with the *Roundup*. Sid and I began work on a "revolution" in *Roundup* production, trying, failing, trying again and finally succeeding to set up a rudimentary system of sending the story copy from the *Roundup* offices in Bldg. 2 to the off-site typesetting location using computer modems.

I still get a warm feeling when I remember our first successful 300 baud transfer of a story sometime in early 1988. By comparison, we routinely use modems today that transfer data at a baud rate of 56,000 bytes a second. It took us months to get a stable transfer system working, but once we had done that it made possible a *Roundup* innovation—increasing the frequency of the *Roundup* from every other week to every week.

The June 10, 1988, *Roundup* was the first weekly newspaper for the center. It was more news-oriented than today's largely feature-oriented *Roundup*. But it was important then because we didn't have the immediacy of electronic mail and Web sites to keep JSC employees informed about what was going on at the center.

The *Roundup* was one of the primary mechanisms for making sure that the entire JSC civil service and contractor team knew what was going on, and this was very important in the months leading up to the return to flight with the STS-26 mission. Being able to communicate the agency's progress in returning the space shuttle system back to flight status was seen as an important task by JSC's top management, and doing that every week was a major accomplishment in which the entire *Roundup* team shared. The *Roundup* continued to be produced on a weekly basis until March 28, 1997.

Of course, the return to flight on Sept. 28, 1988, was probably the biggest story I wrote and edited for the *Roundup*. Thanks to the production streamlining work we had done using electronic transfers, we were able to get the news into the Sept. 30 *Roundup*, including news of the STS-26 crew's welcome home ceremony at Ellington Field following their landing at Edwards Air Force Base in California.

We followed that issue with an Oct. 7 issue that covered all the details of the successful mission, and chronicled the reactions of JSC employees. Those were exciting times at the Space Center, and they laid the groundwork for the 80 shuttle missions that have flown since and the construction of the International Space Station.

The other big issue I remember actually was a look backward. That was the July 14, 1989, commemorative Lunar Landing 20th Anniversary Edition, and it was

another first - the first (and so far, the only) full-color *Space News Roundup* cover.

Untold hours went into the production of that issue, which was made possible by the hard work of Julia Morgan and Jan Knight. We used the official 20th anniversary poster designed by artist Alan Chinchar on the cover, and a full-page photo of the Apollo 16 launch and a quote from President John F. Kennedy's now-famous 1961 Rice University speech on the back.

That issue included a dedication to the Apollo 1 crew who lost their lives in a Jan. 27, 1967, launch pad fire, as well as an amazing historical retrospective article on Apollo 11 by then-editor emeritus Brian Welch and an interview with the Apollo 11 crew. It also included personal reflections of Virginia McKenzie, who told the story of the families who supported Apollo workers like her husband, Joe McKenzie, and an interview with Apollo spacecraft designer Max Faget, whom I saw just the other day in a local hardware store, looking great.

I had the privilege of meeting all three of the Apollo 11 crew members during the ensuing anniversary festivities, and escorting Buzz Aldrin through the crowd at the splashdown party. What a celebration!

Over my 12 years as *Roundup* editor, I figure I coordinated the production of more than 500 papers. I tried to make

each one better than the last, and to share with JSC employees the best information available about what was happening at JSC and in the lives of the people here, who are the heart and soul of this center and this agency.

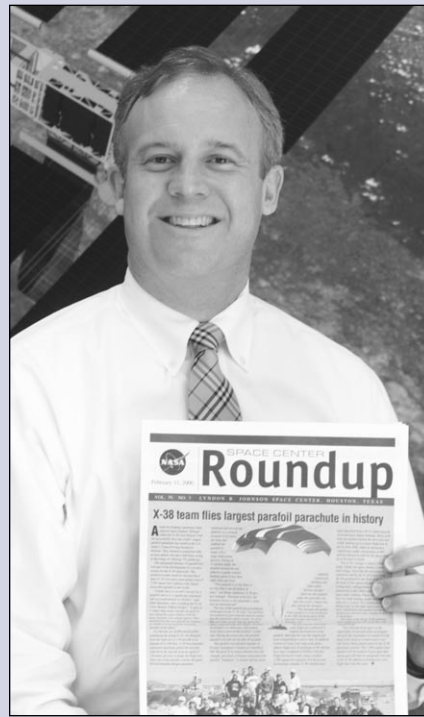
Throughout a dozen years, there were exciting stories to tell, there were heart-warming stories to tell, there were sad stories to tell. That's all part of the job of being an editor. But there are two things I'll remember most.

One is the education I received about how this center, its facilities, its programs and its organizations work to meet the daunting challenges of sending men and women into space, helping them do productive work that is crucial to the continued growth and survival of the human race and bringing them home safely.

Even more important, however, I will remember each and every one of the people whose lives touched me as I chronicled those activities, or whose lives I touched in some small way by being able to record their contributions for posterity.

My last issue as editor was Aug. 7, 1998, and fittingly, that issue was dominated by a tribute to Alan Shepard, whose Mercury/Redstone launch I watched on a tiny black and white television screen on May 5, 1961 and made me say, "Someday, I want to work for the space program." ■

Roundup Memories



NASA JSC 2001e39633 Photo by Robert Markowitz

By Bill Jeffs

When I reflect upon my years as editor of the *Roundup*, I think first of the outstanding teamwork that was involved in producing the newsletter every other week.

I had the great privilege of working with a very talented team of writers, editors, photographers, graphics artists and printers.

Without the proactive work of these professionals, the paper would never have hit the streets. I will forever remember being a part of such a great team.

I was hired by NASA in August 1998 to serve as editor of the paper, a position I held until March of this year. It was a great job for a new employee who wanted to learn about the work that JSC personnel perform on a daily basis – although I'll be the

first to admit that, at least for the first few months, it was a bit like drinking from a fire hose!

I had the privilege of interviewing numerous people about their jobs, from the engineers to members of senior management, from the scientists and researchers in the space and life sciences arena to those responsible for developing future spacesuits and life support systems – just to mention a few.

From biotechnology to nanotechnology, from the space shuttle and the International Space Station to meteorites and space food, it was fascinating to learn just how much work is performed here. Hopefully I was successful, with the assistance of many who served on the *Roundup* staff with me, in telling the many interesting stories about JSC's people – civil servants and contractor personnel – and their work to all of the paper's many readers, both on-site and afar.

Those were fascinating years – but hectic ones. The *Roundup* editor's job never ends. One issue is always going to press while articles and photos for the next issue are being compiled. I know that I drove those who did the layout absolutely crazy with my late afternoon and early morning calls after my many panic attacks about the accuracy of certain articles and cutlines or the layout of certain pages! I'm sure that they are breathing a bit easier now.

I count myself fortunate to be listed among the many talented journalists who have served as editor of the *Roundup* over the past four decades. Happy 40th anniversary, *Roundup*! May the center's fine paper enjoy many more years of success.

JSC celebrates 40 years of human space flight

By Bill Jeffs

By the early beginnings of NASA's and America's human space program some 40 years ago, the Langley Research Center in Virginia had a long and rich history. By the time the National Aeronautics and Space Administration was created in 1958, Langley had been a part of the National Advisory Committee for Aeronautics for close to 50 years, working on the nation's aeronautics program. It was the first home of the Space Task Group (STG), which was formed with NACA/NASA engineers to conduct the Mercury Project. This core group began the early design of Mercury.

Then, on May 25, 1961, just three weeks after Alan Shepard became the first American in space, President John F. Kennedy set a goal for the United States that would surpass any previous engineering and scientific feat: Humans would land on the moon and return safely to Earth before the end of the decade.

"Now it is time to take longer strides – time for a great new American enterprise – time for this nation to take a clearly leading role in space achievement, which in many ways may hold the key to our future on Earth," said the president, speaking before Congress. "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish."

A staggering job beyond the scope of Mercury had been dumped in NASA's lap. "Now how the hell are we going to do that?" one NASA engineer asked a colleague as they sat contemplating the speech in a quiet office at Langley.

Though physically located at Langley until the completion of Project Mercury, the STG was initially part of NASA's Goddard Space Flight Center in Beltsville, Md. It had been decided to incorporate the STG under the mantle of the GSFC because the STG was a highly technical organization whose personnel had little time for administration. Thirty-five STG members were on the roster when the STG was officially born on Nov. 5, 1958. Most were engineers; a few were administrative. Another 15 engineers were on temporary assignment from Lewis Laboratory in Cleveland, Ohio.

With the daunting task ahead, the STG needed new quarters with test facilities and research laboratories suitable to mount an expedition to the moon – not to mention the need for aircraft hangars, huge warehouses and office buildings. Long before it was built, the NASA-center-to-be was designated the Manned Spacecraft Center (MSC) and, from its inception, it was to be the lead center for all space missions involving astronauts.

But where to build it? On July 7, 1961, NASA Administrator James E. Webb directed the establishment of preliminary site criteria and a site selection team. Essential criteria for the new site included the availability of water transport and a first-class, all-weather airport, proximity to a major telecommunications network, a

well established pool of industrial and contractor support, a readily available supply of water, a mild climate permitting year-round outdoor work and a culturally attractive community. By August, some 23 sites had been selected as possibilities. Houston was initially included by virtue of the San Jacinto Ordinance Depot, since military rather than commercial facilities were judged best for helping handle NASA's large retinue of jets and specialized equipment, and because of its recognized, prominent universities – Rice and Texas A&M.

"We were using criteria such as the city location," said Charles F. Bingman, who served as the Manned Spacecraft Center's chief of the Management Analysis Division. "It had to be a city, an urban area that was substantial and could support a major new high-technology institution. It had to be near the kind of airport that could serve as a service organization primarily for handling of spacecraft and conducting certain kinds of flight tests. It had to be on the water, because at that stage they thought they were going to transport spacecraft by barge, which they ultimately never did. It had to be at the site of at least one substantial, high-quality university, and it had to have what looked like an appropriate kind of workforce to staff a number of the positions in the center."

It isn't surprising that when members of the site selection team visited Houston in September 1961 to check out property owned by Rice University and located close to Ellington Air Force Base, they were less than enthusiastic.

What they saw was a flat cow pasture scoured by brisk winds off Galveston Bay. Along Farm Road 146 and 528 leading to what would soon be the main entrance to the MSC, boats had been hurled into the highway, pieces of houses and buildings lay in the field, trees were flattened, and fields and pastures were still flooded or sodden with heavy rains from Hurricane Carla. Ellington, which would provide temporary quarters for many of the STG, offered dreary wartime military housing with peeling paint and a sense of high disrepair.

Much effort would be required to turn it into the new flagship facility of a new age of exploration. But the challenge of turning the site into NASA's new flagship for human space exploration paled in comparison with sending an astronaut to the moon within the next nine years.

On Sept. 19, 1961, NASA announced that the \$60 million manned space flight laboratory would be located in Houston on 1,000 acres of land to be made available to the government by Rice University. The land was owned by Humble Oil Co. and given to Rice to give to the government. In addition to acquiring title to this donation from Rice, the federal government subsequently purchased an additional 600 acres needed to give the site frontage on the highway. A 20-acre reserve-drilling site fell within NASA's total 1,620-acre site.

The STG would be relocated to Houston and it would be redesignated the Manned Spacecraft Center. Just the day before, Houston's population had topped the one million mark. About a month later, on

Oct. 24, the MSC was formally established by NASA.

While the new NASA center was under construction, MSC personnel opened temporary offices in the Gulfgate Shopping Center in Houston in about 3,000 square feet of floor space donated for the purpose by the Gulfgate management. MSC had a continuing operation there until additional office, engineering and laboratory space could be leased and made ready for occupation. The major operations conducted at the Gulfgate offices were largely concerned with procurement, personnel and public affairs. The STG personnel were located in eight other offsite locations scattered along the Gulf Freeway.

In December 1961, Project Gemini was initiated to provide experience in flight endurance, rendezvous and extravehicular activity until Apollo became operational. For several years before being finally relocated at the Clear Lake site in June 1964, the work of the space center included construction of the MSC, the recruitment and training of employees and astronauts, the operation of Project Mercury, design and contracting for projects Gemini and Apollo, design and testing of both Gemini and Apollo hardware, and initial flights of both Gemini and Apollo.

The MSC had been planned as a unique, aesthetically pleasing workplace of laboratories, development and test areas, and administrative offices grouped around a landscaped quadrangle with artificial ponds. A number of state and national contractors and suppliers participated in construction. Contracts for the first 11 buildings were awarded in December 1962.

Now came the task of building the new facility. The Corps of Engineers opened a project office in Houston. Design work was under way in January 1962 and construction on the underground utility systems and roadways began in March. Robert Gilruth, the first director of the MSC, transferred his headquarters to Houston effective March 1.

By January 1964, 2,100 employees were readying for the move to the site with 600 more to be on site by July. The final move from all leased facilities in Houston by MSC employees and contractors occurred in late June 1964, as more than 700 people vacated sites which were the last vestiges of the scattered center while the Clear Lake location was under construction.

Moving first to the center were employees in the Flight Operations Directorate and the Information Systems Division, as well as about 200 contractor employees, six Department of Defense liaisons and other NASA center representatives. Most of these people were located in Bldg. 30, the Mission Control Center-Houston.

The April 1964 launch of the first unmanned Gemini spacecraft coincided nicely with the final relocation of MSC personnel to their permanent site in Clear Lake. Gilruth declared an "Open House" for the weekend of June 6 and 7 and welcomed the public to the new NASA/MSC. Some 52,000 people toured the center and viewed displays depicting the past, present and future hardware of the space program.

By the end of June 1967, everyone in leased offices and warehouses in the Houston area had moved to permanent quarters at the MSC on what had been FM 528. The highway had become NASA

Road 1 in 1965. About 1,500 employees remained at Ellington.

The people of the Houston area welcomed MSC personnel with open arms and offered complete cooperation in all facets of the operation. The city was ecstatic. Space fever promptly swept the town. The baseball team was named

the Astros, and the basketball team was called the Rockets. The Astrodome, Astroworld and countless businesses with "space city" somewhere in the title blossomed over the years.

Engineering the Future

Building the new center was the easy part. But major questions still remained. How does one do these human space missions? How does one design the necessary spacecraft? How does one manage the contractors and garner the best ideas and results from industry?

A seminal strength of JSC has been and continues to be its engineering-based nucleus. From Mercury and Apollo to today's space station, the Engineering Directorate and myriad U.S. contractor teams have played a major role in the design and development of spacecraft – a role that continues to this day.

This engineering effort – the design and development of spacecraft – came before the selection of astronauts and the development of the Mission Control Center.

"We came to Houston," said Maxime Faget, chief engineer, MSC. "We had to build a center. All of the engineering facilities, they all had to be specified, worked out, negotiated and an organization had to be built up. It was a pretty yeasty time. We went from essentially a one-man project (Mercury), a one-program project, to really trying to do three things at the same time, three programs at once plus build up the center."

In addition to the Engineering Directorate, the program office played a major role in managing contracts and implementing contractors. These major entities – the Engineering Directorate, the program office and, soon, the flight controllers and operators – did not operate in a vacuum; the integrated strength of all of these organizations was crucial in achieving NASA's and the nation's grand human space flight objectives. This process was true for the MSC in the early days of human space flight; it still holds true today.

Home of the Nation's Astronaut Corps

They were the Original Seven, the chosen, the first of a new breed of explorers, and in the early 1960s there were few celebrities on the planet who could compare with them. When they made their first trip to Houston on July 4, 1962, all the stops were pulled out. They were given a motorcade along a route lined with cheering admirers. Speeches were made, the welcoming ceremony was pure Texan and a vast barbeque was thrown in their honor at the Houston Coliseum.

Now, four decades later, about 160 astronauts are at JSC including some from overseas. They and the people on the ground supporting them have some of the most advanced training facilities available anywhere to prepare them for the exacting tasks and dangers they will face on actual missions.

The Weightless Environment Training Facility at the center was once



NASA JSC S78-34519



NASA JSCS89-37293



NASA JSCS65-59962

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used to train astronauts for spacewalks. When it proved inadequate for spacewalk training in anticipation of International Space Station assembly, plans were put into motion for the Neutral Buoyancy Laboratory, a 6.2-million-gallon, 102- by 202- by 40-foot pool. Built to support ISS construction, the Sonny Carter Training Facility was retrofitted to house the new NBL, which began operations in January 1997. Complete with mockups including those of station components and the Hubble Space Telescope in the water, the facility is used to train astronauts in procedures they will perform during upcoming missions.

Ellington Field hosts center flight operations. The aircraft include a KC-135 four-engine jet used to produce space-like weightlessness by flying a series of arcs, a twin-engine Gulfstream specially modified to perform like a landing shuttle orbiter and T-38 jet trainers with state-of-the-art instruments that are flown by astronauts to maintain their proficiency.

America's Nerve Center for Mission Operations

Liftoff from Launch Complex 19 at Cape Kennedy was at 10:16 a.m. EST June 3, 1965. The spacecraft with astronauts James A. McDivitt as command pilot and Edward H. White II as pilot was placed in an orbit with a perigee of 100 miles and an apogee of 175 miles.

Gemini IV, with McDivitt and White aboard, landed about 48 miles short of the intended target, the *USS Wasp*, at 11:12 a.m., Houston time, June 7, after making 62 revolutions of the Earth in 97 hours and 56 minutes. Both crew members were in fine shape and were returned to the *Wasp* by helicopter.

For the first time, flight controllers performed their jobs from the new Mission Control Center at the Manned Spacecraft Center. Gemini IV became the first flight controlled from Houston and the longest duration mission to that date. The Cape Kennedy control center provided backup services for the initial launch and trajectory, and Goddard Space Flight Center's computer center provided support for the entire four-day mission. GSFC was the communications center. The computers were in the new MCC for the first time.

This flight established JSC as the nation's home for Mission Control. But this responsibility could have easily gone to Goddard Space Flight Center or to the Kennedy Space Center and, had it, JSC would not be the nerve center for space shuttle and International Space Station flight control operations that it is today.

The concept of a ground-based flight control team to manage human space missions was implemented from the beginning of Mercury. Flight control remains a key element of the mission planning process. For the most part, program offices delineate mission activities and objectives. With its vast expertise, the flight control team uses spacecraft and space station systems to accomplish mission objectives and to monitor the status of flights as they occur.

As Mercury began orbital missions with John Glenn's flight on Feb. 20, 1962, equipment and procedures needed to be created. And when Gemini came on line, the system established for the

Mercury Program had to be updated. The Mercury control center at Cape Canaveral used commercial off-the-shelf electronics gear, but more was needed. It became obvious that existing equipment was inadequate. A study of the needs and options for a new mission control center was begun.

Were flight operations to be part of the design center, MSC in Houston, or part of the operations center at Kennedy Space Center in Florida where Mercury controls were housed? Goddard Space Flight Center in Maryland had the attraction of being conveniently located near the nation's capital and NASA Headquarters. Would travel requirements be greater or less if the control center were located in Maryland, Texas or Florida? It was soon decided that mission control and operations would become a major component of MSC responsibilities.

"Discussions among MSC management quickly recognized that operations requirements would be a critical factor in the design of all manned spacecraft," said former JSC Director Dr. Christopher C. Kraft. "Therefore the location of the astronauts and the flight operations engineers adjacent to the engineers responsible for the management of the aerospace companies building the hardware became a highly desirable requirement. Also it was recognized that once the launch had taken place, the location of a control center on Earth was not a significant factor. Considering these factors, it was decided that the best location for a Mission Control Center and the facilities for training the astronauts would be with the Manned Spacecraft Center in Houston."

The MCC enables the flight control team to perform its critical duties. With the knowledge of the Mercury experience and a vision of what Gemini and Apollo would require, designers and developers began defining the parameters of the MCC in Houston along with its network, recognizing that its hardware would evolve over the years.

Construction of the control center began in late 1962. Evolution of the concept of a control center continued throughout the Apollo Program. Floor space was allocated for representatives of the spacecraft program office who, along with JSC engineering and vehicle contractors, supported each mission. This increased presence strengthened the problem-solving capabilities of the MCC team. The spacecraft program office support team occupied what became known as the "SPAN" or Spacecraft Analysis Room. JSC and industry engineering teams supported missions in this room.

This arrangement allowed immediate contact with key JSC engineering and industry representatives in case assistance were needed in resolving any technical anomalies that might arise during missions.

Houston's initial MCC directed that Gemini IV flight and all subsequent Gemini and Apollo flights and some space shuttle flights. The original MCC working life began with the first spacewalk during that Gemini mission in June 1965 and ended in March 1996 with the

launch of STS-76, which saw the first spacewalk of U.S. astronauts outside of the Russian Mir space station.

By the 1990s, the MCC was becoming outdated. Technology had moved on from the 1960s technology that was supporting the center, but the MCC continued its work until a state-of-the-art center replaced it. The new MCC became operational in July 1995. That original MCC is now a national monument.

Mission operations have matured significantly over the years. Mercury had begun with a fairly simplistic aircraft flight operations approach. The process matured during the Gemini operations when a systems handbook and direct interface between flight control teams and the crew provided real-time, ground-to-air interactions. During Apollo, the operations teams worked together on all issues involving flight systems, flight design, science and human operations.

The shuttle era brought radical changes. Shuttle flights had greater and more diversified capabilities and more participants in terms of federal agencies, institutions and even foreign nations. Shuttle design and construction involved close support from the mission operations team. The shuttle was built with the understanding that good flight operations required something of a symbiotic relationship between the human occupants and the machine.

Fewer operators worked the MCC at JSC than in the days of the Apollo lunar missions, but shuttle flight operations required a networking of the support team composed of the flight control team and the multi-purpose support rooms with the payload operations control centers located at JSC or elsewhere, including Goddard.

Shuttle flight control became much more streamlined than during Apollo flights and depended on advanced information systems and computer programs. The shuttle required all new computer software – adjusted and reconfigured for each mission. Mission planning for early shuttle missions began three or four years in advance.

Today, MCC activities take place in one of two Flight Control Rooms (FCRs or "Fickers"), the White FCR (for shuttle operations) and the Blue FCR (for station operations). Here flight controllers, in performing their command/control and monitoring functions, get information from console

computer displays or projected displays and coordinate with the crews. FCRs use a generic platform that can support all U.S. flight activities. FCRs also support simulations – mission dry runs in which specific tasks may be rehearsed or potential problems and solutions may be addressed.

With the launch of Zarya, the first International Space Station component, in November 1998, station flight controllers and engineering support teams in Houston and Moscow began operations. In the Blue FCR, since the launch of Zarya, to this day and for many years to come, ISS flight controllers conduct continuous joint ISS operations in conjunction with their counterparts



NASA JSC S69-40023

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In the beginning

I was one of the lucky few that worked for NASA when Houston became a vital part of our vocabulary. I began with Space Task Group at Langley on May 8, 1961, as just a young country boy from Iowa. Thus, when I heard the news that we were going to Houston, I said GREAT. I figured Virginia was not my home and since I had only been there under a year, I saw it as a great opportunity to see another part of this great country. First, we thought we would see cowboys, cattle and ranches all over the place – but then the news at that time was dominated by the damage of hurricane Carla, so we were not sure what to expect. Needless to say, I was ready when asked if I would transfer and did so on Jan. 2, 1962.

John J. Thiel
Retired Contracts Manager

From 1959 until we moved to Houston in 1962, my wife, Catherine T. Osgood, and I worked at Langley. She worked in Mission Planning at the Space Task Group for Chris Kraft, and I worked in the Mercury Tracking and Ground Instrumentation Unit for Barry Graves and Paul Vavra. When the announcement came that the MSC site was to be Houston, we were faced with the decision of whether or not to move to Texas. We had hoped that Tampa would be selected since we had previously lived in South Florida. We had found that Hampton was somewhat insular and hoped that Houston might be a little more cosmopolitan. So we decided to move and here we are.

Donald R. Osgood

At the height of the Cold War, the USSR shocked the world by announcing the 1958 launch of an Earth satellite called Sputnik. The nation was galvanized. The U.S. Congress created a new space agency called NASA, and many young Americans dreamed of flying in outer space. I was 16, a junior in high school, with a love for science and engineering. We made toy rockets with mailing tubes and our own fuel formulations of powdered charcoal, sulfur, and potassium perchlorate and launched them from any broad field we could find.

At age 19, a sophomore in college, after accepting a job through the school's cooperative engineering department, I began a career with the newly formed Space Task Group at Langley Air Force Base, Hampton, Va., and reported for work in June 1961. It was the fall of 1961 and I was back at school when everyone learned the Space Task Group was moving to Houston. When I returned to work in the winter of 1962, everyone was infected with excitement about the prospects of a new life in Texas, and so I also followed Aldous Huxley's advice to "Go West, young man." My first co-op tour in Houston was in the Houston Petroleum Center (HPC Building) at I-45 and Wayside. Looking back, it has been a rewarding and exciting career. After nearly 40 years in Houston, I think I have been transformed into a Texan.

Joseph Thibodeau

I cannot be sure what my reaction was, but I think it was a feeling of relief that a decision had been reached despite the last-minute reconsideration of Boston as a possible site for MSC. As I recall, personal feelings of most of the employees were mixed. That is, most of the employees considered that the Langley Field area was "home" – either by having been born and raised there or by adaptation from having lived and worked there for many years. In spite of that, I feel that most of us realized that there just was not room in the Langley area for both the Langley Center and MSC. So we reluctantly made plans for moving.

Paul Purser

I was working in the Space Task Group at Langley Field when NASA announced that we would relocate to Houston. I was really thrilled. I didn't like the other sites that were being considered. My husband, Raymond, was working for NASA-Langley and he transferred to the Space Task Group. We were both glad to head for Houston.

Betty Ensley, retired secretary to Dr. Faget

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in the Russian Flight Control Room in Korolev, Russia, a Moscow suburb. The ISS presented new challenges. It is a multinational program with partners from around the globe. Many of these partners participate in the planning and execution of real-time operations. Thus people in the Mission Control Center must interface with their counterparts located in control centers around the world. The Spaceflight Control Center in Korolev is where the Russian flight controllers support operations of the Russian elements of the space station.

The Triumph of Apollo

Apollo was a feat of modern technology. Apollo 8 expedited the journey to the moon. Scheduled to be the first human Apollo launch by a Saturn V, Apollo 8 was originally scheduled to test the manned Lunar Module in an Earth orbit. Changing it to a translunar mission marked a giant step in NASA's lunar landing drive.

On July 16, 1969, Apollo 11 left Earth for a mission to land men on the moon. As Apollo orbited the moon, the Lunar Module, known as the "Eagle" by its two crewmembers, Armstrong and Edwin Aldrin, separated nicely from the mother ship on the back side of the moon. But when the Command Module cleared the moon and communications resumed with Mission Control, communications and telemetry between the MCC in Houston and Apollo were bad.

At this point Mission Control had about five minutes in which to decide whether or not to abort the lunar landing. Then, with the Lunar Module four minutes away from its landing, the crew discovered that its altimeter and velocity gauges were in error. Those problems were corrected. Next the crew reported a computer alarm. A quick flight control analysis resulted in a decision to continue. But as the Eagle prepared to set down, Armstrong was forced to override the planned landing site to avoid rocky and dangerous terrain. The Eagle did land with less than 30 seconds of fuel remaining. For a time, due to unanticipated irregularities of the lunar gravitational field, NASA did not know precisely where.

For many who worked at JSC in April 1970, the flight of Apollo 13 will never be forgotten. Never before had the hostility of space been so starkly evident and the threat of catastrophe so imminent.

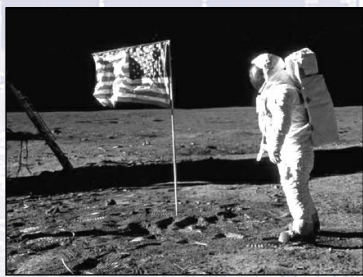
The flight was launched on April 11, 1970. Disaster struck on April 13. The spacecraft had reached 85 percent of the distance to the moon when an oxygen tank exploded, wiping out the main supply of life-sustaining oxygen and power. People all over the world responded to the plight of the three astronauts in the crippled spacecraft.

The astronauts moved out of the stricken Command Module and into the cramped quarters of the Lunar Module. The Lunar Module, built for the short

trip for two people to land on the moon, would serve as the lifeboat for a four-day journey for three people. Using the Lunar Module's descent engine for propulsion, the crew looped the spacecraft around the moon and headed home.

While each element of the rescue was carefully planned and carried out, the crew battled cold, fatigue and physical discomfort. The Lunar Module's 49.5 hours of life support for two people had to be stretched to 84 hours for three people. With guidance from JSC spacecraft experts and life-support engineers, the Apollo 13 astronauts jury-rigged marvels of ingenuity for survival.

After splashdown in the Pacific Ocean on April 17, Apollo 13 was called a brilliant demonstration of the human capability under almost unbearable stress. At JSC it was known by many as "the finest hour."



NASA JSC S11-40-5875

"I look back on Apollo 13 as an ultimate test of all of our capabilities," said Apollo Flight Director Glynn Lunney. "The circumstances surrounding the explosion presented the team with a situation which had almost only one unique scenario for success out of a large set of other possibilities. Success was due to the tremendous teamwork of talented people integrated into a very powerful problem-solving team of operators, flight controllers and crews-engineering, program office personnel and contractor teams throughout the country."

The Apollo Program came to an end in 1972. By that time, astronauts had extended the range and scope of their lunar explorations.

Expanding the Center's Role

Whereas space flights through Apollo 11 concentrated on development and operations, later Apollo missions, then Skylab and, more recently and to an even greater extent, space shuttle and ISS flights have focused on operations, science and applications. Reorganizations of the center's directorates in the early 1970s denoted the rising significance of science and applications in space flight programs. The Lunar Samples Office, a Planetary and Earth Sciences Division and a separate Earth Observations Aircraft Program Office sprung up across the center. Today, JSC remains NASA's repository for lunar samples and its home for the study of the science and medicine of space flight.

From the first moon rocks of the late 1960s to today's Martian meteorites, JSC scientists have led the way in the study of fascinating rocks to better understand how our solar system, and perhaps life itself, came into being. The curators of these Apollo moon rocks and Antarctic meteorites are preparing for the return of samples by two current NASA missions: Genesis will collect samples of the solar wind and Stardust

will return samples of Comet Wild 2. Meanwhile, the team is developing plans to bring home samples of Martian soil and rocks to continue the search for life beyond Earth.

From the beginnings of the space program, flight surgeons and life sciences researchers have played an important role in the human space flight team. Flight surgeons helped select the first astronauts and worked with them to better understand how the human body would react to space travel.

For more than 40 years, astronauts, in cooperation with life scientists, have studied adaptation to space. One of the three objectives of the Mercury Program was to observe human performance during launch, Earth orbit and landing. What began with the first EKG transmitted from Sheperd's Mercury capsule became weeklong medical experiments aboard the space shuttle and today's continuing, in-depth scientific investigations aboard the International Space Station.

Several physicians have themselves become astronauts. In 1965, Dr. Joseph "Joe" Kerwin was among those selected as part of the first group of scientist-astronauts. He was joined two years later by Drs. Donald Holmquest, Story Musgrave and William Thornton.

"Over the last 40 years, the efforts of NASA's life sciences researchers have led to a better understanding of human reaction to living in the space environment and to the development of countermeasures to overcome the negative aspects of living in the space environment," said Dr. Sam Pool, assistant director for space medicine in JSC's Office of Bioastronautics. "Today's life scientists perform peer-reviewed research to help astronauts not only live in space, but thrive there. Research into the neurological system, the cardiovascular system, nutrition, and bone density are just a few of the many important areas of research to ensure humans will be fully prepared for our next journey – the exploration of our solar system."

The Next 40 Years

Scheduled for completion about 2006, the International Space Station will have a mass of about 1,040,000 pounds. It will measure 356 feet across and 290 feet in length, with almost an acre of solar panels to provide electrical power to six laboratories.

The ISS will establish an unprecedented state-of-the-art laboratory complex in orbit.

Research in the station's six laboratories will lead to discoveries in medicine, materials and fundamental science that will benefit people all over the world. JSC's role is to assure that the ISS vision is successful.

For the next 20 years, the center's focus will be on safely operating the space station with America's international partners. Whether future space missions will see human beings travel back to the moon, on to Mars or both, the ISS will serve as a stepping-stone to future destinations in the universe. ■

For a complete history of JSC, visit:
www.jsc.nasa.gov/pao/public/history

In the beginning

continued

I worked in the Wind Tunnel section at the Marshall Space Center in Huntsville when I heard the announcement about the MSC. My family had just returned from a trip to Fort Walden, Fla., where the Gulf is so beautiful. Thinking the Gulf must be the same all around its perimeter, I immediately submitted an application to the Space Task Group for a transfer. I was accepted and instructed to move to Langley, Va., and travel with the group to Houston in about four weeks. I argued to move directly to Houston and wait on the main body from Langley. My first office was in the Rich Building on Telephone Road. It was very lonely for several weeks. We raced down to see the mud flats of Galveston! I was assigned to the Apollo Pad-Abort flights out of White Sands as an Instrumentation engineer. I worked under Max Faget.

John Overton

I joined NACA in 1948. When I returned from my "Navy tour of duty" in 1955, I began working at Langley Field, Va., Wallops Island, Va., Ft Bragg, N.C., and Huntsville, Ala., on tasks related to the Mercury Project. In 1960, I was notified that I had been assigned to a group that would be going to a new center, which would be named later. My main concern was how it would affect my wife and three children.

Paul A. Folwell

I started in the Space Task Group on Dec. 7, 1959. I was in the thermal group with 12 others. Started on Mercury, Gemini, etc. I came from North American Aviation in Columbus, Ohio, and when we came to Newport News, Va., the houses were smaller and it was a step down. When the news came about moving to Houston we didn't know anything about it. Work was busy and we looked at literature and felt it was another venture to challenge. We got a trip to come down to Houston and look the place over and it was an exciting time. The move took place and we did our work and we got the spacecraft off the ground. I worked with developing all of the heat shields and I retired in 1993 with 34 years tenure.

James E. Pavlosky

The news that we were to move from Virginia to Texas did not disturb my wife and myself as much as it perhaps did to those that were native Tide Water Virginians, for after all, it was only two-and-a-half years since we had been uprooted and left Canada to come and work in the US Manned Space Program. Texas was unfamiliar territory to us – we had traveled to other parts of the U.S., but had never ventured to Texas (too hot, we were told)!

The rumors were rampant – hot, sticky weather, mosquitoes, rattlesnakes and dubious politics! But we came anyway, as it was the job we had signed on for, and I was deeply committed on the Mercury and Gemini programs. My first visit was shortly after hurricane Carla had hit the Clear Lake area, and I must confess, I wondered "What on earth are we doing coming to this place?" But, after being here a while, and especially after discovering the Texas Hill Country, we were convinced, and now, after many years here, we are enjoying retirement in the beautiful Hill Country at Wimberley.

Rod Rose
(NASA 1959-1984)